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ABSTRACT

The paper summarizes four presentations made by members of the Pennsylvania State University Program for Learning Disabled (LD) students. An initial section considers the definition of LD and reviews a study on diagnosing LD in 12 undergraduates. The existence of a foreign language disability in students with good attitudes toward learning a foreign language, but who have repeatedly failed foreign language courses, is discussed, and analysis of scores on the Modern Language Aptitude Test are analyzed. A study to develop norms for evaluating written expression is described. Intervention programing is said to include procedures based on behavioral theories as well as availability of special equipment on a long term basis. Intervention is programed according to the amount of structure needed by the student. (CL)

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The Learning Disabled University Student:
A Synopsis of Applied Research

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Introduction

By legislative mandate, institutions of higher education are charged with the responsibility of providing an appropriate education for their students who are learning disabled. An increasing number of these institutions are currently in the process of either initiating programs or allowing adjustments for learning disabled (LD) students (Cordoní, 1982). The literature contains several articles dealing with problems faced by both college and university personnel and learning disabled students, including admission requirements, identification, curriculum selection and modification resources, staff development, advising, and characteristics within specific domains (Barsch, 1980; Birely & Manley, 1980; Gajar, Murphy, & Hunt, 1982; Kahn, 1980; Vogel, 1982; Wells, 1973). Research addressing these areas of concern is either sparse or non-existent (Vogel, 1982). This is due, in part, to the fact that until recently attention and funding has been focused on early identification of learning disabilities. Also, misconceptions concerning realistic post-secondary school goals for learning disabled students have contributed to the lack of meaningful applied research aimed at facilitating higher education for these students.

The purpose of this paper is to present a synopsis of four presentations addressing preliminary research efforts conducted by students and personnel involved with LD students at The Pennsylvania State University. Areas of study include the diagnosis of learning disabilities at the university level; assessment within specific domains (foreign language and written expression); and the development of individualized intervention programming.

Diagnosing a Learning Disability

Definition. The most concise definition of Learning Disabilities was formulated by the National Advisory Committee on Handicapped Children (NaCHC, 1968), and was subsequently incorporated into PL 94-142. Final Federal regulations for identifying LD students, adopted by the Commonwealth of Pennsylvania, include the following criteria:

- (a) The student does not achieve commensurate with his or her age and ability levels and/or the student demonstrates a severe discrepancy between achievement and intellectual ability in one or more of the following areas:
 - (i) Oral expression;
 - (ii) Listening comprehension;
 - (iii) Written expression;
 - (iv) Basic reading skill;
 - (v) Reading comprehension;
 - (i) Mathematics calculation;
 - (Vii) Mathematics reasoning.
- (b) A student may not be identified as having a specific learning disability of the severe discrepancy between ability and achievement is primarily the result of:
 - (1) A visual, hearing, or motor handicap;
 - (2) Mental retardation;
 - (3) Emotional disturbance;
 - (4) Environmental, cultural or economic disadvantage(Federal Register, 1977).

Diagnosis. Based upon the NaCHC definition of learning disabilities, students referred to the program were administered the Wechsler Adult Intelligence Scale (Wechsler Adult Intelligence Scale-Revised when it became available) in order to obtain a measure of cognitive functioning and academic aptitude. The Woodcock-Johnson Psychoeducational Battery (Part 2) was administered to obtain current levels of academic achievement in reading, mathematics, written language, and general knowledge. Clients were also given a timed written assignment and completed an intake form which included an informal reading inventory. The Modern Language Aptitude Test (MLAT) was also administered.

Seven male and five female undergraduates ranging from 19-29 years of age, were identified as learning disabled. They exhibited problems in written communication, study skills, reading, and in completing foreign language requirements.

Intellectual functioning of each of the twelve students, as indicated by the Wechsler Adult Intelligence Scale (WAIS), ranged from average to superior (full scale IQs on the WAIS ranged from 104 to 122).

Academic achievement on the Woodcock-Johnson Psychoeducational Battery (Part 2) was variable. In general the students exhibited a discrepancy between their intellectual ability and their performance on various achievement clusters. In each case discrepancy was related to the reason for referral. Additionally, all students performed in the average to superior range on the knowledge cluster.

The students who were referred for difficulty with study skills did not exhibit a discrepancy between academic aptitude and academic achievement. These students had been identified in elementary school as learning disabled and had been recommended for special class

placement. Informal tests administered to these students revealed continuing problems with extracting relevant information from visual and written stimuli, and problems with organization and poorly developed time management skills.

Several students were referred to the program and were not found to be eligible for services provided by the program.

Various definitions of learning disability state that a discrepancy between ability and achievement must exist. The definitions also imply that deficits in academic aptitude not be the primary reason for the learning problem. At present, there is no information available which indicates which WAIS-R scores reflect sufficient academic aptitude for success at Penn State. Students referred with WAIS-R verbal IQs below 100 were not included in the program, but were referred to other university tutorial and vocational counseling services. A study is currently underway to obtain normative data on the WAIS-R with Penn State students, which will facilitate future interpretation of assessment data. It has been assumed that students with Verbal IQs below 100 would not demonstrate sufficient academic aptitude to successfully complete the course of study at Penn State. Therefore, the academic aptitude, rather than a learning disability, might well have been the primary reason for difficulty with coursework.

One student referred for having difficulty learning a foreign language did not exhibit an aptitude/achievement discrepancy. This student, however, had failed four consecutive terms of an elementary foreign language course and was trying to complete his second term of a different language curriculum. His foreign language professors

and tutors verified extensive remedial efforts. After a series of informal and language aptitude tests had been administered, it was concluded that this student exhibited a specific learning disability in the acquisition of a foreign language.

Foreign Language Disability

A number of students have been referred because they were having difficulty learning a foreign language. Questions which immediately come to mind include: whether such a foreign language disability exists, how is it diagnosed, and what interventions might be helpful in coping with it?

The existence of a foreign language disability. Studies addressing the existence of a specific foreign language disability have not been conducted. However, a review of the literature concerning the study of foreign languages indicates that many students identified as possessing a high degree of academic aptitude (as measured by intelligence and/or various achievement measures) fail to learn a foreign language (Ayers, Bastamente, & Campana, 1973; Carroll, 1962a). Attrition rates in foreign language training schools conducted by the military have at times reached the 80th percentile (Williams & Leavitt, 1947). Some teachers and psychologists hold a strong belief that learning a foreign language may involve unique talents and skills not required by other academic subjects (Carroll, 1962). Two-thirds of the foreign language teachers sampled in an international survey felt there was "such a thing as linguistic aptitude apart from general intelligence" (Fife, 1931, p. 135).

Admittedly, the existence of a foreign language disability is equivocal. However, students with good attitudes toward learning a foreign language, but who have repeatedly failed foreign language courses, in spite of intensive tutoring, are being referred for diagnosis. Perhaps students with good attitudes toward learning a foreign language but who exhibit a discrepancy between general aptitude (as measured by intelligence and achievement measures) and foreign language achievement are Learning Disabled.

In order to develop University norms for predicting success in learning a foreign language at The Pennsylvania State University and to identify predictors of success in learning a foreign language, the following procedures were conducted.

The Modern Language Aptitude Test (MLAT). The Modern Language Aptitude Test was selected as a potential measure of foreign language aptitude. Its subtests purport to assess a variety of abilities (memory, auditory discrimination and grammatical sensitivity) thought to be related to foreign language learning ability. These abilities have been cited in the LD literature as potential areas of deficit in LD populations. For example, Learning Disabled children often demonstrate particular deficiencies in the processing of syntax (Meier, 1971; Rosenthal, 1970; Semel & Wiig, 1975; Wiig & Roach, 1975; Wiig & Semel, 1976). Learning Disabled students also exhibit deficits in auditory discrimination and memory (Boder, 1973; Denckla, 1977; Hallahan & Kauffman, 1982; Ingram, Mason, & Blackburn, 1970; Myklebust, 1965; Rorgesen & Kail, 1980). In addition to measuring specific abilities, a general consensus exists that the MLAT is the best

available predictor of achievement in foreign language learning (Allen & Natelson, 1977; Gardnes & Lamber, 1972; Lutz, 1967).

The MLAT consists of the following five subtests administered through an audio recording (see Carroll & Sapon, 1959):

Part 1: Number Learning. This subtest is reported to measure memory and "auditory alertness" which is thought to be important in auditory comprehension.

Part 2: Phonetic Script. This assesses "sound-symbol association ability" and appears to be related to the ability to understand and mimic speech sounds.

Part 3: Spelling Clues. This highly speeded test is dependent on sound-symbol association ability and knowledge of English vocabulary.

Part 4: Words in Sentences. This is thought to measure "sensitivity to grammatical structure" and is thought not to depend on formal instruction in grammar, since no grammatical terminology is involved.

Part 5: Paired Associates. This is a test of rote memory.

Procedure. In order to determine if the MLAT was related to foreign language learning of students at The Pennsylvania State University, the test was administered to students enrolled in introductory French, German, and Spanish classes. The sample consisted of 42 students from 4 French classes; 57 students from 3 Spanish classes; and 83 students from 5 German classes. MLAT scores were then compared with foreign language course performance represented by each student's final grade in his/her foreign language course.

Results. The fourth subtest of the MLAT and an attitudinal measure (Raymond, 1983) resulted in a reasonably accurate prediction of foreign language achievement. The fifth subtest of the MLAT entered into the regression analysis in the third step.

Discussion. MLAT-4 reportedly assesses "sensitivity to grammatical structure" (Carroll & Sapon, 1959, p. 4). Low scores on the MLAT 5 are symptomatic of a memory deficiency, likely attributable to the use of inappropriate mnemonic strategies by the learner. There is a growing body of literature demonstrating the effectiveness of certain mnemonic strategies for improving one's foreign language vocabulary learning ability (Paivio & Desrochers, 1981). These techniques, in particular the "keyword" method, are of greatest benefit to students who do not initially perform well on memory tasks (Pressley, Najamura, Hope, Bispo, & Toye, 1980). While these diagnostic tests (i.e., the MLAT-4, MLAT-5) are by no means deterministic of foreign language proficiency, there does exist a moderate relationship. Recent research suggests that the information these tests provide is potentially valuable; future research will dictate how valuable the information is.

For now, it is suggested that students who exhibit good attitudes toward learning a foreign language but who score low on the MLAT subtests and have shown low achievement in learning foreign languages may be learning disabled.

Written Language Disability

Referrals to the LD program at Penn State have included students who exhibit problems with written expression. Federal regulations include written expression as an area in which LD students exhibit a

potential/achievement discrepancy. Difficulty with written expression at the University level gives rise to questions similar to those presented by students who exhibit difficulty learning a foreign language: How does one diagnose a disability with written expression? What can be done after diagnosis?

The existence of a written language disability. As is true for the foreign language domain, studies addressing a written language disability at the University level have not been conducted. LD adults, however, exhibit problems with written expression (Blalock, 1981; Cordoni, 1980; Murray, 1968; Vogel, 1982). Vogel and Moran (1982) in a pilot study of LD adult essays, found that LD groups were lower on word selection, total T unit points, and the percent of complex T units. LD students scored significantly lower on mechanics, spelling, points on total sentences, and on the percentage of compound complex sentences.

Studies of characteristics associated with written expression include fluency, vocabulary, and syntactic maturity as developmental indicators.

Fluency. Fluency has been shown to be positively correlated with age (Bear, 1934; Cartwright, 1968a; Frogner, 1933; Hoppes, 1933; LaBrant, 1933). Clause length and the use of complex sentences also increases with age. Variety in sentence length and types are additional fluency factors (Goda & Griffith, 1962; Harris, 1948; Heider & Heider, 1948; Hunt, 1965). A number of studies have concentrated on T-unit length rather than sentence length because of the difficulty in defining a sentence. Hunt, (1965, 1970) and others have used T-unit length as a fluency measure and found it to be a reliable indicator of maturity in written language.

Vocabulary. Like fluency, vocabulary richness and diversity expand as a person matures (Templin, 1957).

Syntactic maturity. Syntactic maturity ". . . including the rules of language grammar and mechanics" (Cartwright, 1969, p. 634) ensures communication between writer and reader. Research indicates that syntactic maturity tends to increase as individuals get older (Hunt, 1965). Typically, mature writing is characterized by a greater number and variety of transformations (Hunt, 1970). With progressive development, individuals use longer T units, lengthened by sentence-combining transformations and loaded with adjectives, adverbs, prepositional phrases, and appositives (Kidder, 1974, p. 61). Since growth in fluency, vocabulary, and syntactic maturity have been shown to be part of the overall development of written expression, these characteristics were chosen for analysis by the Penn State program.

In order to develop University norms for evaluating written expression at Penn State University and to study predictive variables, the following procedures were conducted.

Procedure. The normative sample included students enrolled in basic English writing courses. Each student wrote a composition using the following protocol.

Directions: You will have 30 minutes to plan and write an essay on topic printed below. YOU CANNOT BE GIVEN CREDIT FOR AN ESSAY ON ANY OTHER TOPIC.

You must fit your essay on the paper provided in the following pages. You will receive no other paper to write on. You will find that you have enough space if you write on every line, avoid wide margins, and keep your handwriting to a reasonable size.

Assume that your home-town newspaper has invited you to submit your essay as a possible editorial. Spend a few minutes planning your essay, perhaps jotting down a few notes in the space below the question. Consider the following quotation:

"In going forward, there are always certain risks."
For example, progress often demands moving from the secure to the uncertain.

Decide how true you think this statement is. Then, using examples from your observation or experience, try to persuade your readers to accept your point of view.

When the supervisor announces that thirty minutes have passed, you must stop writing your essay, so plan carefully and observe the time.

Each composition was then graded independently by English professors utilizing a scoring scale of 1-5; five indicating a superior essay. Scores were determined by the rater's judgement of structure, content, and overall impression. Visual inspection of ratings indicates that statistical analysis will reveal a high degree of interrater reliability. Ratings did not vary more than one point on each of the compositions.

In addition to holistic ratings, composition characteristics including fluency, vocabulary, and syntactic maturity will be analyzed by means of a computer program developed by Dr. Cartwright at Penn State (1983). Fluency will be measured by the number of words produced by the student, and by the number of words in sentences and paragraphs. Vocabulary will be analyzed by diversity as measured by the number of different words in a student's composition. In addition, diversity will also be calculated by the average number of words which appear between each occurrence of the most frequently used word in the composition and by the repeat rate for the words or "the probability that two words picked at random from the text will turn out to be the same word." Syntactic maturity will be evaluated in terms of the

number and mean length of T-units (clauses) in a student's writing and the types of sentences used (statements, questions, exclamations). Statistical analyses of the essays cited and normative tables should be available by the beginning of summer term 1983.

Intervention Programming

Characteristics exhibited by LD University students include a high academic aptitude with variable performance on academically related skills. Weaknesses appear in numerous domains and in specific disciplines (e.g., foreign language). The heterogeneous composition of these students indicates the necessity for single-subject research designs incorporating individualized strategies.

At Penn State, following formal assessment, individual intervention is planned with each student. Plans include specified long- and short-term objectives, strategies for achieving each objective, and criteria for evaluating achievement of objectives. Intervention strategies incorporate procedures based on behavioral theories (e.g., task analysis, positive reinforcement, contingency contracting, response cost rehearsal, and errorless learning).

One form of intervention consists of making special equipment available to the student on a long-term basis. This equipment may include tape recorders and dictaphones for taping and transcribing lectures and written assignments. Tape-recorded texts, chapters, and articles are also available.

This type of intervention is most useful with students who already possess good study and time management skills. Given equipment and strategies which enable them to circumvent their weak areas, these

students are able to independently implement the ideas and are thus better able to meet the demands of a college curriculum.

Students without well-developed organizational skills, however, need a more structured intervention. In these cases, a graduate student is often assigned to the LD student. The role of the LD student and graduate assistant vary on a continuum of highly structured to unstructured.

Least structured. In the least structured program, the learning disabled student maintains maximum independence by initiating all activities. The student is responsible for knowing his/her needs and seeking assistance when necessary. The graduate student acts as a resource person, directing the LD student to appropriate sources. Positive reinforcement for appropriate requests for assistance and independent problem solving is also provided by the graduate assistant.

Moderately structured. In the moderately structured program, the learning disabled student meets regularly with the graduate assistant. During these sessions, the student reviews any problems he/she has encountered since the last meeting and together with the graduate assistant generates alternative solutions for each. The emphasis in this program is on training the student to begin monitoring his/her own needs and on teaching time management and behavior modification strategies which the student learns to prescribe and implement on his/her own. Ultimately, prescheduled meeting times are phased out and the student operates within the least structured program described above.

Highly structured. In the most structured program, the student meets with the graduate assistant at least once each week to review

a highly specified behavioral contract. This contract specifies objectives which the student must meet daily, such as outlining text chapters or attending lectures. The graduate assistant provides reinforcement for objectives met as well as academic tutoring when necessary.

Conclusion

Each year an increasing number of learning disabled students are seeking a college education. These students possess the potential for successful college careers. Specific difficulties, however, hinder them from competing successfully with their peers. The absence of research addressing LD university students indicates that each program should develop diagnostic instrumentation pertinent to their curriculum. Assessment instruments should predict success in University curricula and include University norms. Due to the heterogeneous composition of the LD University population, the study of specific problems calls for individualized intervention and the use of single-subject design.

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